

NON-PUBLIC?: N
ACCESSION #: 9502140136
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Joseph M. Farley Nuclear Plant - Unit 1 PAGE: 1 OF 3

DOCKET NUMBER: 05000348

TITLE: Reactor Trip Due To A Loss of Turbine DEHC Overspeed
Protection
EVENT DATE: 01/13/95 LER #: 95-001-00 REPORT DATE: 02/06/95

OTHER FACILITIES INVOLVED: J. M. Farley Unit 2 DOCKET NO: 05000364

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R.D. Hill, General Manager - TELEPHONE: (334) 899-5156
Nuclear Plant

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 0758, on January 13, 1995 with Unit 1 in mode 1 operating at 100 percent power, the reactor tripped due to a turbine trip in response to a loss of digital electro-hydraulic control (DEHC) overspeed protection. The primary overspeed protection (OPC) controller (DROP 2) failed in a manner which prevented the redundant OPC controller (DROP 52) from assuming control of the turbine DEHC overspeed protection function within the designed time frame. This resulted in a turbine trip due to a loss of both OPC controllers.

An investigation determined this event was most likely caused by the response of the DEHC OPC processors and their associated power supplies to minor voltage transients. An evaluation of the DEHC system design indicated a vulnerability of the DEHC system to minor voltage transients. Modifications have been performed to the DEHC system in order to reduce

the vulnerability to minor voltage transients.

The unit was returned to power operation at 2203 on January 17, 1995.

END OF ABSTRACT

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Plant and System Identification

Westinghouse -- Pressurized Water Reactor
Energy Industry Identification System codes are identified in the text as XX!.

Description of Event

At 0758, on January 13, 1995 with Unit 1 in mode 1 operating at 100 percent power, the reactor tripped due to a turbine trip in response to a loss of digital electro-hydraulic control (DEHC) JJ! overspeed protection.

Cause of Event

A root cause investigation indicated that within the DEHC system, the primary overspeed protection (OPC) controller (DROP 2) failed in a manner which prevented the redundant OPC controller (DROP 52) from assuming control of the DEHC overspeed protection function within the designed time frame. This resulted in a turbine trip due to a loss of both OPC controllers.

On-site testing identified a vulnerability of the DEHC power supplies and associated OPC processors to minor voltage transients. A DEHC system configuration specific to Farley Nuclear Plant was assembled in a test system at the vendor's facility. An evaluation of the test results conducted at the vendor's facility confirmed the on-site test results. These tests concluded that under certain conditions the DEHC system's response to minor voltage transients would result in an inability to transfer OPC control from DROP 2 to DROP 52 within the designed time frame. This would result in a turbine trip due to a loss of both OPC controllers.

Safety Assessment

This event is reportable because of the actuation of the reactor protection system.

All systems operated as designed.

This event would not have been more severe if it had occurred under different operating conditions.

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Corrective Action

A root cause analysis investigation was performed.

Modifications have been performed to the Unit 1 and Unit 2 DEHC systems which have reduced the vulnerability of the DEHC OPC processors and their associated power supplies to minor voltage transients.

Additional Information

The turbine's mechanical overspeed trip device, which is the turbine's primary overspeed trip protection, was operable during this event.

Additional DEHC system modifications are planned to further enhance the reliability of the DEHC system.

A temporary recorder was installed to monitor DEHC system voltage. To date, no unexpected voltage transients have been observed.

The unit returned to power operation at 2203 on January 17, 1995.

Further review of data associated with the December 25, 1994 Unit 2 reactor trip (LER 94-004, Unit 2) indicates that both the 12/25/94 Unit 2 trip and the 1/13/95 Unit 1 trip could have been caused by the response of the DEHC OPC processors and their associated power supplies to minor voltage transients. Modifications to Unit 2 DEHC system were completed on January 30, 1995, to reduce the vulnerability to the minor voltage transients.

The following LER's involved reactor trips associated with DEHC system failures.

Reactor trip due to a loss of turbine DEHC overspeed protection: LER 94-004, Unit 2.

Reactor trip due to turbine control system intermittent failure: LER 94-003, Unit 2.

Manual reactor trip due to governor valve closure caused by a

degraded DC voltage output from the primary Operator Auto Controller power supply in the main turbine DEHC system and a failure of the circuitry which should have transferred the power supply: LER 91-010, Unit 1.

Reactor trip caused by a voltage transient on the DEHC inverter: LER 89-015, Unit 2.

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Southern Nuclear Operating Company
Post Office Box 1295
Birmingham, Alabama 35201
Telephone (205) 868-5131

Dave Morey Southern Nuclear Operating Company
Vice President
Farley Project the southern electric system

February 6, 1995

Docket No.: 50-348 10 CFR 50.73

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Joseph M. Farley Nuclear Plant-Unit 1
Licensee Event Report No. 95-001-00
Reactor Trip Due To Loss of Turbine
Digital Electro-Hydraulic Control Overspeed Protection

Gentlemen:

Joseph M. Farley Nuclear Plant Licensee Event Report No. 95-001-00 is being submitted in accordance with 10 CFR 50.73. If you have any questions, please advise.

Respectfully submitted,

Dave Morey

REM/clt:lrtbdehl.doc

Enclosure

cc: Mr. S. D. Ebnetter
Mr. B. L. Siegel
Mr. T. M. Ross

*** END OF DOCUMENT ***
